

Authors

Ian M. Andrews

IBM United Kingdom, Hursley, England

Mr. Andrews is assigned to the Product Test Laboratory at Hursley. His current interest is in vibration and displacement analysis. Mr. Andrews received a B. Tech. degree from Brunel University in London in 1964. He was a Scientific Officer at the National Physical Laboratory in the UK from 1964 to 1967, after which he was involved with operations research. He joined IBM in 1968. He is a member of the Institute of Physics and the Institution of Electrical Engineers.

Christopher H. Bajorek

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Dr. Bajorek is a member of a storage devices and materials group at the IBM Thomas J. Watson Research Center, which he joined in 1971. His present interests include materials for magnetic recording and magnetic bubble devices as well as device design and evaluation. He received a B.S. degree in 1967, an M.S. degree in 1969 and a Ph.D. degree in 1971, all in electrical engineering, from the California Institute of Technology. Dr. Bajorek is a member of Sigma Xi.

J. A. Barker

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Dr. Barker is a member of the thin film and surface science department at the Research Laboratory in San Jose, where he joined IBM in 1969. His current research interests include intermolecular forces, surface structure of liquids and solids, adsorption and the scattering of atoms and molecules from surfaces. He received a B.Sc. in physics in 1944, B.A. in mathematics in 1945, and D.Sc. in chemistry in 1958, all from the University of Melbourne, Australia. From 1950 until 1967 he was a research scientist with the Commonwealth Scientific and Industrial Research Organisation, Australia, with the exception of the academic year 1958-1959, which he spent as Senior Visiting Fellow in the Department of Chemistry, University of Bristol, England. In 1968 he was appointed as Professor in the Department of Physics and Applied Mathematics at the University of Waterloo, Canada. In 1967 he was elected Fellow of the Australian Academy of Science. His published works include a book, *Lattice Theories of the Liquid State*, Pergamon Press, Oxford, 1963.

Bastian Bechtle

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Mr. Bechtle is a member of the advanced technology group, where he joined IBM in 1970. He is currently on assignment to the computer sciences department at the IBM Thomas J. Watson Research Center, Yorktown Heights, New York, where he is working on real time system design for a mechanical assembler. Previously he has worked on operating systems, small computer design, and real time control of electromechanical devices. He received a Dipl. Phys. degree from the University of Stuttgart in 1970.

Michael V. Bobetic

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Dr. Bobetic is an Assistant Professor, Department of Mathematics, at the newly formed Concordia University (formerly Loyola College), which he joined in 1971. His current research interest is in the study of realistic, multiparameter intermolecular functions of rare gases as well as in the derivation of their properties from these potentials. He received an M.S. in applied mathematics in 1954 from the University of Zagreb, Yugoslavia. In 1961 he was a Research Associate in the Physics Department of the University of Illinois. From 1967 to 1971 he held a lecturer position in the Mathematics Department of the University of Waterloo, Waterloo, Ontario, where he received a Ph.D. in applied mathematics in 1971. On two occasions, 1970 and 1975, he participated in studies connected with his research interest at the IBM Research Laboratory for Large Scale Computation in San Jose, California. Dr. Bobetic is a member of the American Association for Advancement of Science.

Calvin A. Bruce

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Dr. Bruce is currently a member of the exploratory technology department at the Research Laboratory in San Jose, where he joined IBM in 1969. He is currently interested in magnetic particulate coatings, ink jet technology, and laser transfer printing. Dr. Bruce received his B. S. degree in chemical engineering from Clarkson College of Technology, Potsdam, New York in 1965. He obtained the M. S. and Ph. D. degrees from Stanford University in 1967 and 1969, where he specialized in the flow of non-Newtonian liquids. Dr. Bruce is a member of the American Chemical Society and the Society of Rheology.

Fred. G. Gustavson

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Dr. Gustavson is a member of the mathematics department at the IBM Thomas J. Watson Research Center. His primary interest has been in developing theory and programming techniques for exploiting the sparseness inherent in large systems of linear equations. He has worked in the area of nonlinear differential equations, linear algebra, symbolic computation, computer-aided design of networks, design and analysis of algorithms, and programming applications. From 1960 to 1961 and

again from 1962 to 1963 he was engaged in research and teaching at Rensselaer Polytechnic Institute. From 1961 to 1962 he was with the U.S. Army Research Center, University of Wisconsin. He joined the mathematics department at Yorktown in 1963. During 1965 and 1966 he taught courses at Baruch College, City of New York. He received the B.S. degree in physics in 1957 and the M.S. and Ph.D. degrees in applied mathematics in 1960 and 1963, all from Rensselaer Polytechnic Institute. Dr. Gustavson received an IBM Outstanding Contribution Award for his work in sparse matrices and an IBM Outstanding Invention Award, jointly with R. K. Brayton and G. D. Hachtel, for the sparse tableau approach to network analysis and design. The latter work received the IEEE Circuit Theory Best Paper Award in 1971. He is a member of the Mathematical Association of America and Sigma Xi.

Patrick A. V. Hall

British Ship Research Association, Wallsend, England

Dr. Hall was a Research Fellow with the IBM United Kingdom Scientific Center at Peterlee from 1973 to 1975, working in the applications technology section on relational data bases. His special interests were optimization of data base access and relational algebras as nonprocedural data manipulation languages. In 1961 he was graduated with a B.Sc. in electrical engineering from Cape Town University and in 1964 received a B.A. in mathematics from Cambridge. From 1964 to 1966 he worked as a research programmer with English Electric LEO Computers and in 1966 entered London University to begin research for a Ph.D. in pattern recognition, which he received in 1971. From 1969 until he joined IBM he lectured on computer science at the City University, London. On completion of his IBM fellowship Dr. Hall joined the British Ship Research Association to work on data base aspects of CAD. His book, *Computational Structures*, has just been published by Macdonald and Janes/American Elsevier.

Michael L. Klein

Chemistry Division, National Research Council of Canada, Ottawa, Canada

Dr. Klein is Senior Research Officer and member of the theoretical studies group of the Chemistry Division of NRCC. His research interests include the study of interatomic and intermolecular forces and the dynamics of atoms and molecules in solids and fluids. Dr. Klein received a B.Sc. degree in 1961 and a Ph.D. degree in 1964, both in chemistry, from the University of Bristol, U.K. He was CIBA Fellow at the Physics Department of the University of Genoa, Italy, 1964-1965, and was ICI Fellow, Theoretical Chemistry, at the University of Bristol, 1965-1967, and Research Associate in the Physics Department at Rutgers University, 1967-1968. He was IBM World Trade Fellow at the San Jose Research Laboratory in 1970. Currently he is Visiting Professor at Université Paris VI in Laboratoire de Physique Théorique des Liquides. Dr. Klein is joint editor of *Rare Gas Solids*, published this year by the Academic Press. He is a member of the Canadian Association of Physicists, the Chemical Institute of Canada, the Chemical Society, and the American Physical Society.

Robert J. Kobliska

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Dr. Kobliska is a member of the thin film materials group at the IBM Thomas J. Watson Research Center, which he joined in 1973. His current technical activities include characterization and evaluation of materials for magnetic bubble devices. Currently he is investigating the temperature dependence and annealing behavior of the magnetic properties of these materials. He received a B.S. degree in 1969, an M.S. degree in 1970, and a Ph.D. in 1973, all in physics, from the University of Chicago. Dr. Kobliska is a member of the American Physical Society.

Jack A. Leendertz

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Mr. Leendertz is a consultant in the design of laser optical systems for engineering measurement. While working at Loughborough University of Technology, he developed holographic and speckle pattern techniques for the measurement of surface strain, vibration and contours. He also developed video techniques to replace photographic methods and permit real time interferometric studies with scattering surfaces. He received a B.Sc. in physics from Bristol University and is currently engaged in electronics work there.

Burn Jeng Lin

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Dr. Lin joined IBM in 1970 as a member of the technical optics group at the Thomas J. Watson Research Center. His current technical interests include the simulation of near-field diffraction by submicron patterns and the development of deep-ultraviolet conformable printing to extend photolithography to the submicron region. He received a B.S. in electrical engineering from the National Taiwan University in 1963 and an M.S. and Ph.D. in electrical engineering from the Ohio State University in 1965 and 1970, respectively. From 1965 to 1969, he also worked as a research associate at the Electroscience Laboratory of the Ohio State University on microscopic holography, electromagnetics, and submillimeter spectroscopy. Dr. Lin is a member of the Optical Society of America and the Institute of Electrical and Electronics Engineers.

Henri J. Nussbaumer

Compagnie IBM France, La Gaude, France

Mr. Nussbaumer, who is an IBM Fellow, initially joined IBM France at the development laboratory in Paris in 1957, where he worked on solid state circuits. In 1960, he transferred to the Poughkeepsie laboratory and worked on electrodeposition of magnetic films. He returned to IBM France at La Gaude in 1962 as manager of an advanced development group working on parametric circuits. He was appointed manager of line switching product development in 1964, manager of technology from 1965 to 1973, and manager of education and technical vitality from 1973 until 1975. He received an IBM Outstanding Contribution award in 1969 for work on electronic crosspoint switches and has received twelve invention awards for work on parametric circuits and communication techniques. Mr. Nussbaumer graduated from Ecole Centrale des Arts et Manufactures, Paris, in 1954.